THE LOST WESTERN SETTLEMENT OF GREENLAND, 1342

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THE LOST WESTERN SETTLEMENT OF GREENLAND, 1342

by

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The Western Norse Settlement in Greenland disappeared suddenly, probably in 1342. Research in the area includes medieval sources, archeological studies of the ruins, climatic data from the Greenlandic icecap, oral stories from the Inuit in Greenland and Canada, and possible sightings of ancestors of the Norse in the Canadian Arctic. Feeling threatened both physically by the Thule (ancestors of the Inuit) and a cooling climate, and economically by the Norwegian crown, the Roman Catholic Church, and the Eastern Settlement in Greenland, the Western Settlement voluntarily left en masse for the new world, probably in 1342 based on sailing dates.

_____, Committee Chair
Candace Gregory-Abbott

_____
Date

PREFACE

I was volunteering on a trip from Hudson Bay to Baffin Island with *Students on Ice* in 2007, when I heard the zodiac driver say, "there is a Viking trading site in the South Savage Islands." That made me curious, as trading sites take time and trust to develop. I thought to myself, the *Icelandic Sagas* said that the Vikings only visited the New World until about 1030. Did they travel to America after that? It was a cold and foggy day, and we were looking for polar bears, which we found. These were more interesting to students on the trip than a medieval site, so I let it go at the time.

At about the same time, I read Jared Diamond's book *Collapse: How Societies Choose to Fail or Succeed.* He had many interesting theories, but I found myself questioning his statements about Greenland. Having lived among Norwegians for two years of my life, I know that they handle cold better than most people, and also that they both catch and eat a lot of fish. His statement on page 261 that "they had a prohibition against eating fish" sounded, well, fishy to me.

Between hearing about a Viking trading site and reading Diamond's book, I became curious about the Greenland settlements. My first project in returning to school at California State University, Sacramento, was on the Norse Settlers of Greenland. While there were two settlements, I found myself drawn to the Western Settlement, because it suddenly disappeared in about 1342. Over the past four years, I worked on different elements of the Western Settlement, figuring out that pirates did affect the Eastern Settlement, but were fully employed with the Hundred Years War when the Western Settlement disappeared. I finally decided to study it for my thesis.

There was only one problem. Research on this subject has never been collected in one place, so I have traveled to Norway, Iceland, and Greenland following the clues of what happened to the settlement. The University of Greenland in Nuuk was a gold mine of information. Much of the research has never been translated from Norwegian and Danish, which I read well. Also researchers have focused on specific areas of study, without looking at the entire body of literature on the subject. The prevailing theory was that cooling temperatures and encroaching Thule affected the settlement, which departed suddenly, but there was no way of really solving what happened to the Western Settlement. What I found about the end of the settlement has both surprised and excited me. There was a logical end to the settlement from both physical and economic factors, which I plan to convey in this thesis.

DEDICATION

This thesis is dedicated to two people, one very much alive, and another who is unfortunately only alive in his wonderful spirit.

First I dedicate this work to Amy Terrell, geologist for the State of California, who allowed this farm girl to wander a chemical spill site, learn glaciology, and figure out how perchlorate was trapped in lenses of clay soil. This solved a cleanup issue that baffled hydrologists for numerous years. When I was ready to give up on this project last winter, she reminded me of my passion for finding what happened to the Greenland settlements, and told me to finish my thesis. So I put away my unfounded thesis that the pirates did it, and found the research I needed in Nuuk, Greenland, this past August. She was with me in spirit when I travelled by boat to the Sandnes farm on August 20, 2011. I thought to myself, what would Amy say about this site? I have learned to consider the topology I see, to figure out what happened at an earlier time.

Secondly, I dedicate my entire graduate program to the memory of Roy "Fritz" Koerner, who I met in Antarctica in 2002. He encouraged me to return to school in my late 50s, and start a new career giving history lectures on cruise ships. I went on three trips with him with the *Students on Ice* program based in Ottawa, Canada, and appreciated his open encouragement of my first lectures on "Erik the Red" and "Roald Amundsen and the Northwest Passage" in 2005 and 2007. His irreverent humor and foul mouth were part of his charm as he mentored the bright teenagers traveling with *Students on Ice*. He died too soon, disappearing suddenly from a fast-moving cancer in 2008. His spirit lingers on in the students he mentored (myself included), and in the work he was doing on climate change on his beloved Devon Icecap. I still miss him.

ACKNOWLEDGEMENTS

I owe a deep debt of thanks to my professors at California State University, to librarians and professionals in California and Europe, to my grandparents and parents who gave me wonderful role models, and to my support team of friends and family.

First, I acknowledge my lead professor, Dr. Candace Gregory-Abbott, for her passion in teaching medieval history, and for her belief in me as a student. I thank Dr. Jeffrey Wilson for his interest in this project as second reader, Dr. Aaron Cohen for helping me keep a sense of humor, and Dr. Mona Siegel for guidance with my degree. In addition, I thank the four professors for whom I have served as teaching assistant: Dr. George Craft, Dr. Jeffrey Wilson, Dr. Nikolaos Lazaridis, and Dr. Michael Vann.

Secondly, I appreciate the professionals who helped me find information on medieval Scandinavia and the Western Settlement. At California State University, Sacramento, Ben Amada helped me with medieval sources, while Jack Smith helped me extensively with works in Norwegian, Swedish, and Danish through Interlibrary Loan. I thank librarians at the National Archives near London, Bristol City Library, University of Bristol, University of Oslo, University of Bergen, University of Iceland in Reykjavik, Snorre Sturlason Center in Reykholt, Iceland, and University of Greenland at Nuuk. In Bergen, Professor Geir Atle Ersland gave freely of his time. In Nuuk, I give special thanks to Sissel Gram at Groenlandica Library, and Lars Heilmann and Johanne Grønvold of Ameralik Tours for the boat trip to the ruins.

Next, I am grateful to my grandparents and parents. Grandma Francis tutored me in German, and was the first world traveller in my life (she was in Germany when the Berlin Wall went up). Grandpa Pribble taught me the analytical skills of checkers and pinochle at an early age. Grandma Katie went back to school at age 59 to be a nurse, and married Grandpa when she was 69, moving from Michigan to California. My dad Bill Francis taught me to focus on details and see projects through. My mom Helen Pribble Francis went back to school to be a teacher after raising four kids, and is still my biggest cheerleader. AFS dad Kåre Strande taught me the balance of dancing, while AFS mom Annemor helped me learn Norwegian as an exchange student. (I still benefit from having had Thor Hexeberg as my Norwegian teacher at Nes Gymnas).

Finally, I acknowledge my friends and family who keep me on track on a daily basis. I have special gratitude to Nancy Ottum, who solves my computer problems, to Jennifer Silva Souza, who is one semester ahead of me and now teaching English in the rainforest of Brazil, and to my best friend Cynthia Paulson Hayashi, who typed my first masters' thesis. I also thank my two Great Pyrenees four legged friends, who insist on walks when I am exhausted. Thumper walks me, and I walk Tomba.

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Chapter 1

INTRODUCTION

In the early 1340s, something was amiss in the Western Norse Settlement in Greenland. They usually paid their taxes and church tithes with natural goods as they lacked money. While sometimes late to be sure, they usually managed to send walrus tusks and tough walrus skin rope, polar bear skins and other furs, and the valuable white or grey gyrfalcons favored by kings, to pay their bills in Norway. These shipments were rare, but lucrative enough to risk sailing through ice-filled channels to Greenland, and back across the stormy North Atlantic to Bergen. The Western Settlement had not paid its taxes since 1327; this fostered rumors that they had abandoned Christianity for a heathen lifestyle of hunting and fishing. In the early 1340s, church emissary Ivar Baardsson came from Norway to investigate, and to collect the funds due the church.

When he got to Sandnes, the largest farm of the settlement, he found neither heathen nor Christian, and loose cows, sheep, goats, and horses wandering around. Although later accused of only looking at one farm, he saw four smaller farms on the left side of the fjord, and two very large farms on the right side as he arrived. Since these farms lacked smoke coming from their chimneys or signs of activity, Baardsson concluded they were deserted. His crew knew the cattle would not survive a winter in the open, so they slaughtered as many of the animals as they could carry, and returned to the Eastern Settlement totally mystified. Baardsson blamed the Thule, ancestors of the Inuit, for destroying the settlement, but there was no sign of bloodshed or battle.

Only one clue surfaced in the *Icelandic Annals*, and then burned up in a fire at the Skálholt bishopric in 1630. As bishop of Skálholt from 1630 to 1638, Gisle Oddsson reconstructed in 1637 the most important clue of what happened to the Norse from memory. He had poured over the books in the library while his father was the previous bishop, and decided that the Greenland material was too valuable to lose, that in 1342 the inhabitants of Greenland left the true faith and went to America.

Historians had trouble believing his memory about the burned record. In the late 1300s, the European world lost sailing directions to the settlements when pirates sacked Bergen, killing the sailors who knew the route. Denmark and Norway later fought over who was to blame for the demise of the Western Settlement in the 1340s, and the Eastern Settlement in the late 1400s. Many theories surfaced, first blaming political authorities for not sending ships to Greenland. Others suspected the natives of hurting settlers, or pirates of kidnapping settlers in the 1400s. The Norse were rigid, not adapting to Arctic conditions, some said, while others thought they starved to death.

Scientists later joined with historians to identify climate cooling for making it hard on the small Norse cows in the winter, and bringing the Thule down the coast of Greenland hunting the ring-necked seals. The Thule outnumbered the Norse, who lost several hunting grounds and their domestic animals to Thule hunters. Plus the church wanted churches built by the wealthiest farmers, Norwegian kings raised taxes and restricted trade, and the Eastern Settlement used resources for large church buildings. One day the settlers had enough. Feeling threatened physically and economically, the Western Settlement voluntarily left en masse for the new world, probably in 1342.

Greenland has remained on the outskirts of world civilization and research interest. No one seemed to collect all of the information available to determine what caused the sudden collapse of the Western Settlement. While it was easy to disagree with some of Jared Diamond's conclusions in *Collapse: How Societies Choose to Fail or Succeed*, he brought much needed attention to the Greenland settlers, not just its melting icecap. The Eastern Settlement, with visible ruins, better accessibility, and more integration with Icelandic society, left a better record. The Western Settlement has remained more of a historical mystery, especially since it did not say its goodbyes.

While historians disagreed on theories about what happened to the Western Settlement, they showed considerable convergence of ideas. Information about the Western Settlement came from many sources, including medieval runic symbols, *Icelandic Sagas* and *Icelandic Annals*, general history of Scandinavia, specific studies of the Western Settlement, archeological diggings, and climate data. The Western Settlement had many strong points, and attracted a specific type of settler who wanted a life of hunting and fishing away from civilization. These settlers still clung to the Viking mentality of sharing resources, and objected to increasing greed from outside authorities, including the Eastern Settlement. Concurrently, climate cooling brought the Thule into their hunting grounds, and precipitated the final sudden departure, probably in 1342 from sailing records. Numerous sightings in the Canadian Arctic pointed to their survival as hunters beside the ice-dependent Inuit. The first step in solving the mystery consisted of looking at available native stories and professional studies to see if there were patterns giving clues as to what might have happened.

Chapter 2

OVERVIEW OF HISTORIOGRAPHY

Due to lack of literacy in the Norse Western Settlement in Greenland and few notations in medieval records, historians studying the settlement turned to oral stories from the Inuit in Greenland and Canada, archeological studies of the sites, and climatic data from the Greenlandic icecap. Theories about what happened to the Western Settlement showed more convergence of ideas than one might expect in reading individual articles. Reviewing the work of thirty-five writers gave the following theories, with authors naming several problem areas even if they rarely agreed with each other:

1. Fifteen sources: Climate cooling.
2. Fourteen sources: Norse emigration to America.
3. Eleven sources: Competition with the Thule, but not extermination of the Norse by the Thule.
4. Ten sources: Tension with the crown and church.
5. Nine sources: Norse departure in a hurry, and en masse.

Other theories included ecological problems such as erosion or pests (six sources); a shrinking or weakened population (six sources); extermination by the Thule (five sources): assimilation with the Thule (three sources); lack of trade (three sources); ethnocentrism (two sources); and starvation (one source). Most scholars believed that several factors led to the Norse departure, with agreement since a large excavation in 1976-77 on climate cooling, Thule encroachment, and departure of the group en masse.

The largest agreement among scholars was that a cooling climate caused problems for the Norse.[1] This theory came from climate change data starting in 1950, when Jørgen Meldgaard wrote the first of several articles on the Western Settlement. From his studies, Meldgaard documented the Arctic conditions, small insecure farms, and greater vulnerability to the movements of the Thule that faced the Western Settlement.[2] Disagreeing with Fridtjof Nansen's earlier theory of cultural assimilation, he stated there was little cross-cultural learning between the Norse and the Thule; the two groups had little chance of successful coexistence competing for hunting grounds.[3]

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[1] Supporting this area were CBS News, June 7, 2011, "How Greenland's cold beat the Vikings." http://www.cbsnews.com/stories/2011/05/31/scitech/main20067616.html (accessed 19 August 2011, printed copy, University Library, Nuuk, Greenland); Helene Duprat, "Hvorfor forsandt Grønlands tidligere boscettere? [Why did Greenland's earlier settlers disappear?]" http://videnskab.dk/miljo-naturvidenskab/ hvorfor-forsvandt-gronlands-tidligere-bosaettere, 1 june 2011 (accessed 19 august 2011, printed copy, University Library, Nuuk, Greenland); James Robert Enterline, *Viking America: the Norse Crossings and Their Legacy* (Garden City, NY: Doubleday, 1972); Frode Fyllingsnes, *Undergongen til dei norrøne bygdene på Grønland i senmellomalderen [Downfall of the Norse settlements in Greenland in the late middle ages]* (Oslo: Middelalder Forum, 1990); Helge Ingstad, *Westward to Vinland: The Discovery of Pre-Columbian Norse House-sites in North America*, translated from the Norwegian by Erik J. Friis (London: Jonathan Cape, 1969, Norwegian printing 1965); Gwyn Jones, *The Norse Atlantic Saga: Being the Norse Voyages of Discovery and Settlement to Iceland, Greenland, America* (London: Oxford University Press, 1964); Richard Lewis, "Climate helped drive Vikings from Greenland," Brown University, May 30, 2011, http://news.brown.edu/pressreleases/2011/05/vikings (accessed 19 August 2011, printed copy, University Library, Nuuk, Greenland); Mads Lindegaard, *Grønlands Historie [Greenland's History]* (Gullander, Skjern, Denmark: Nyt Nordisk Forlag Arnold Busck, 1991); Thomas Howatt McGovern, *The Paleoeconomy of Norse Greenland: Adaptation and Extinction in a Tightly Bounded Ecosystem*, Dissertation (Ann Arbor, MI: University Microfilms International, 1981); Jørgen Meldgaard, "Landmandsliv i Grønlands Nordbotid [Peasant life in Greenland's Norse Period]," *Handle (Trade)*, 19 January, 1950; Farley Mowat, *Westviking: The Ancient Norse in Greenland and North America* (Boston: Little, Brown, 1965); Frederick J. Pohl, *The Viking Explorers* (New York: Thomas Y. Crowell, 1966); Kirsten A. Seaver, *The Frozen Echo: Greenland and the Exploration of North America ca A.D. 1000-1500* (Stanford, CA: Stanford University Press, 1996); Kathy A. Svitil, "Archeology Watch: "The Greenland Viking Mystery," Discovery, 28 July 1997, *The Museum of Modern Art/Film Stills Archive*; Erik Wahlgren, *The Vikings and America* (London: Thames and Hudson Ltd., 1986).

[2] Jørgen Meldgaard, *Nordboerne i Grønland, en vikingebygds historie [The Norse in Greenland, a Viking Settlement's History]* (København: Munksgaards Forlag, 1965), 87, 93-94, 98.

[3] Jørgen Meldegaard, "Om de gamle Nordboer og deres skœbne, betragtninger over Helge Ingstads bog 'Landet under Polarsternen.' [About the old Norse and their fate taken from Helge Ingstads book *Land under the Polar Star*]," *Tidsskriftet Grønland [Journal on Greenland]*, March 1961: 98-100. Nansen's theory comes later in this section.

This theory has had scientific verification in lake core measurements taken at Kangerlussuaq near the Western Settlement by Brown University (published in 2011). Starting around 1100, temperatures dropped over an eighty year period up to four degrees Celsius or seven degrees Fahrenheit during the summers. This caused shorter growing seasons, less livestock food, more sea ice cutting shipping, and longer winters.[4]

Secondly, a large number of authors believed that the Norse emigrated to America.[5] This theory appeared in the Icelandic Annals, rebuilt by Gisle Oddsson in 1637, that the Norse abandoned the Christian faith and emigrated to America in 1342.[6] Modern support came from the late 1800s from Inuit stories and the sightings of European-looking natives in the Canadian Arctic. In 1875, Henrik Rink published stories from the Labrador natives about a very strong people called Tunneks or Tunnits who lifted huge blocks of stone, and built houses on the islands of Labrador. Missionaries collecting the original stories heard free mixing of the names Tunnit and

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[4] Lewis, 1.

[5] Supporting this area were Franz Boas, *The Central Eskimo* (Lincoln: University of Nebraska Press, 1964; original in Sixth Annual Report of the Bureau of Ethnology, Smithsonian Institution, Washington, 1888), 226-28; Enterline; G. M. Gathorne-Hardy, "A Recent Journey to Northern Labrador," *The Geographical Journal* 56, 3 (March 1922): 153-169; A. W. Greeley, "The Origin of Stefansson's Blond Eskimo," *National Geographic Society* 13 (Dec. 1912): 1225-1238; Vera Henriksen, *Mot en verdens ytterste grense [Toward a world's furtherest border]* (Värnamo, Sweden: Aschehoug, 1988); Hjalmar R. Holand, *Explorations in America before Columbus* (New York: Twayne Publishers,1956); William Hovgaard, *The Voyages of the Norsemen to America* (New York: Kraus Reprint Co., 1971, original printing 1914; *Grønlands Historiske Mindesmærker [Greenland's Historical Monuments,* third volume] (København: Det kongelig nordiske oldskrift-selskak, 1845, reprint København: Rosenkilde og Bagger, 1976); Poul Nørlund, *Viking Settlers in Greenland and their descendants during Five Hundred Years* (New York: Krause Reprint Co., 1971, reprint, original Copenhagen: G. E. Gads Forlag, 1936); Frederick J. Pohl, *The Viking Settlements of North America* (New York: Clarkson N. Potter, 1972); Edward Reman, *The Norse Discoveries and Explorations in America* (Berkeley: University of California Press, 1949); Henrik Rink, *Tales and Traditions of the Eskimo,* translated from the Danish by the author (Montreal: McGill-Queen's University Press, 1974, original Edinburgh: William Blackwood, 1875); Seaver, *The Frozen Echo;* Vilhjálmur Stefánsson, *My Life with the Eskimo* (New York: Macmillan Company, 1919).

[6] *Grønlands Historiske Mindesmærker*, 460-62. Original text burned, word America obviously added at later unknown date, per Henriksen, pg. 138.

Grönlaender [Greenlander].[7] Gathering Inuit stories on the Tornits for the Smithsonian Institution in 1888, Franz Boas described their distinctive deer hunting practices using cairns (piles of stones) connected by ropes. The Tornits left in fear for their lives after stealing kayaks from the Inuit, who retaliated while the larger Tornits were sleeping.[8]

Sightings of European-looking natives in the Canadian Arctic lent credibility to the theory that the Norse left for America. Vilhjálmur Stefánsson described "Blond Eskimos" with blue eyes, light-brown beards, rusty-red hair, other European features, and no prior contacts by the Inuits with Europeans, on Victoria Island in the central Canadian Arctic.[9] A. W. Greeley mapped out the numerous sightings from various explorers of hybridized Inuits with European features across the Canadian Arctic.[10] From the study of genetics, William Hovgaard believed that European women and men both went to the Arctic to contribute the recessive traits of light eyes and reddish hair.[11]

The third area of agreement was that the Norse settlers faced increased competition with the Thule for vital hunting grounds, leading to inevitable friction.[12] The largest problem for the Western Settlement as the climate cooled was the migration

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[7] Rink, 469-70. Spelling varies between Tunnit, Tornit, Tunit and Tunnek.

[8] Boas, 226-28.

[9] Stefánsson, 192, 194-96. Eskimo is a derogatory term in Greenland and Canada; the term Inuit will be used in this paper, except as used by the author in titles or quotes.

[10] Greeley, 1225. Explorers looking for the Northwest Passage in the early 1800s noted very tall individuals with light-colored eyes and long beards.

[11] Hovgaard, 46-48, 50.

[12] Supporting this category were Jared Diamond, *Collapse: How Societies Choose to Fail or Succeed* (New York: Viking, 2005); Erik Erngaard, *Grønland i tusinde år [Greenland in a thousand years]*, 2nd ed. (Viborg, Denmark: Sesam Forlaget, 1972, 1982; Finn Gad, *Grønlands Historie I: Indtil 1700 [Greenland's History, part I, to 1700]* (København: Nyt Nordisk Forlag Arnold Busck, 1967); Holand; Lindegaard; McGovern; Jørgen Meldgaard, "Fra Brattalid til Vinland, part II, Hvor lå Markland og Vinland? [From Brattalid to Vinland, part II, where lay Markland and Vinland]," *Naturens Verden (Nature's World)*, December 1961, 370-385; Eric Oxenstierna, *The Norsemen*, translated from German and edited by Catherine Hutter (Greenwich, Conn.: New York Graphic Society Publishers, 1965, German printing 1959); Pohl, *The Viking Settlements of North America*; Seaver, *The Frozen Echo*; Wahlgren.

of the Thule down the Greenland coast, as they soon outnumbered the Norse. This made the walrus hunting grounds at Disko Bay too dangerous for the Norse, costing them their export trade to Europe according to Eric Oxenstierna.[13] Finn Gad noted that the sharing of hunting areas at Disko Bay and on the coast proved impossible for the two cultures, leading to confrontations. The Thule had no concept of private property, butchering the freely grazing Norse domestic animals and heightening conflict.[14]

The most surprising area of agreement was in a growing and general tension between the Norse settlers and the crown and church authorities.[15] This theory became more dominant in the 1980s and 1990s. Thomas Howatt McGovern saw a social structure of the rich dominating small farmers and exhausting their small margin needed for survival. This included an extensive church building program in the Eastern Settlement taking away from communal pursuits.[16] Documenting an escalating conflict with the Roman Catholic Church in Iceland and Greenland, Christian Keller noted that the church tried to seize both churches and surrounding lands.[17] Kirsten Seaver concluded that the Norse settlers voluntarily severed ties with the Norwegian crown and Catholic Church in leaving the Western Settlement.[18]

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[13] Oxenstierna, 251.

[14] Finn Gad, *Grønland [Greenland]* (Aarhuus, Denmark: Politikens Forlag, 1984), 69-70.

[15] Supporting this category were Enterline; Holand; Christian Keller, *The Eastern Settlement Reconsidered: Some Analyses of Norse Medieval Greenland*, Dissertation (Oslo: 1989); Mads Lindegaard, *Grønlands Historie [Greenland's History]* (Gullander, Skjern, Denmark: Nyt Nordisk Forlag Arnold Busck, 1991); McGovern; Meldegaard, *Nordboerne i Grønland*; Tryggvi J. Oleson, *Early Voyages and Northern Approaches 1000-1632* (Toronto: McClelland and Stewart Limited, 1963); Pohl, *The Viking Explorers*; Kirsten A. Seaver, *The Last Vikings: The Epic Story of the Great Norse Voyagers* (London: I.B. Tauris, 2010); Wahlgren.

[16] McGovern, 259-263.

[17] Keller, *Eastern Settlement Reconsidered*, 5, 34.

[18] Seaver, *The Frozen Echo*, 137-138.

The fifth and final area of agreement was that the Norse left their homes in a hurry and as a group.[19] This theory came from artifacts found in archeological diggings starting in the 1930s. Poul Nørlund detailed many implements and utensils lying around, with the largest Sandnes farm showing a rapid abandonment.[20] According to Jørgen Meldgaard, the Norse left suddenly despite having sufficient burning material and food stuff at the end.[21] Thomas Howatt McGovern saw a long-term decline in the settlement, with accumulated minor changes leading to a swift and catastrophic end.[22]

The historiography of the Western Settlement pointed to a sudden breaking point from a cooling climate and competition with the Thule coming down the coast. The Thule outnumbered the Norse, who lost their ability to harvest luxury goods from the hunting grounds at Disko Bay, which they used to pay their taxes and tithes. As the Thule moved down the coast, they blocked the exit to the Western Settlement and then came into the settlement to hunt caribou. Simultaneously, the Norwegian crown and church demanded higher tithes, taxes, and ownership of church property built by the largest farmers in the settlement. The best hypothesis is that the Norse decided that their best chance of survival was to leave, with the year 1342 best matching available sailing records . They were often in Labrador getting lumber and crude iron. After several forced moves, they probably learned the native lifestyle and survived for a time in the Canadian Arctic, mixing with the Inuit.

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[19] Supporting this category were Diamond; Enterline; Gad, *Grønlands Historie*; Henriksen; McGovern; Meldegaard, *Nordboerne i Grønland*; Nørlund, *Viking Settlers in Greenland*; Oxenstierna; Pohl, *The Viking Settlements of North America*.

[20] Nørlund, *Viking Settlers in Greenland*, 137-39.

[21] Meldgaard, *Nordboerne i Grønland*, 87, 93-94, 98.

[22] McGovern, 259-263.

Historical researchers looking at the Western Settlement have faced several stumbling blocks, including lack of primary sources, lack of accessibility to the ruins, and a political conflict that divided scholarship into competing national interests. First of all, the Western Settlement in Greenland was a preliterate society, with no written records saved from the time or discovered in archeological study. Most written information about medieval Greenland came from two sources: the Icelandic Sagas, written down much later in Old Norse; and the Icelandic Annals, written down yearly in Latin. The sagas gave heroic narratives, not historical fact. While the annals were accurate journals, they concentrated on the more Europeanized Eastern Settlement, which had more contact with Iceland and Norway due to its location and inhabitants.

Secondly, modern scholarship focused on the larger and easily accessible Eastern Settlement to the south, which still had visible ruins from a gradual collapse at the end of the 1400s. Medieval Icelandic literature also gave more focus to the Eastern Settlement with which it had more contact. The Western Settlement took many hours to reach, deep in a multi-fjord system connected only at the coast. In addition, high tides and silt coming into the fjords from nearby glaciers limited accessibility.[23] When finally examined, the ruins of the Western Settlement contained many artifacts for study, showing evidence of a sudden evacuation or collapse in the 1340-60s. These rich finds stimulated study of the Western Settlement in its own right.

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[23] Aage Roussell, "Farms and Churches in the Mediaeval Norse Settlements of Greenland," reprint from *Meddelelser om Grønland [Reports on Greenland]*, #89 (Copenhagen: C. A. Reitzels Forlag, 1941), 17-18. Austmannadal had rich farms rivaling Sandnes, now inaccessible due to silt from glaciers. In 1765-75, Ameragdala fjord was still accessible, without clay and gravel clogging the fjord.

While archeologists mapped out much of the Western settlement by the 1930s, this period also included a deep rift between the two countries most interested in the research, Denmark and Norway. The main question was modern, as both countries claimed Greenland: "which of the two nations was better fitted to govern Greenland."[24]

Norway came under Danish rule with the Kalmar Union in 1397. At the end of the Napoleonic Wars, the Treaty of Kiel awarded Norway to Sweden as a war prize in 1814. The Danes acquired Greenland, the Faroes, and Iceland, although Norway continued to use the East Coast of Greenland for sealing and hunting.[25] A fight over ownership erupted between the two countries in 1931. Denmark filed suit in the World Court, winning total control of Greenland in a judgment of 5 September, 1933.[26] Feelings between the two countries ran high: "For a year every Dane and Norwegian who met fought their own private war of claims."[27] This fight led to a break between Norwegian and other Nordic archeologists, avoiding Norwegian interpretations of the Norse farms. Research suffered from national compartmentalization, ignoring larger political unions and economic trading in northern Europe which affected the Norse.[28]

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[24] Fyllingsnes, 231.

[25] *Time Magazine*, "Norway-Denmark: Brother Christian Wins," April 17, 1933, http://www.time.com/time/magazine/article/0,9171,847290.00.html (accessed 16 October, 2011). Denmark acquired the Atlantic colonies on the statement by an Irishman Edmund Bourke: "These colonies have never belonged to Norway." Norway owned the colonies since the 1260s, but missed the transfer, having lost their newly declared independence of May 17, 1814, to a union with Sweden until 1905. Denmark used only West Greenland until 1917, when it claimed the entire island, increasing activity in 1931. Norway retaliated by claiming a 350 mile strip of the eastern coast in 1931, naming it "Eric the Red Land."

[26] World Court, "Legal Status of Eastern Greenland, Denmark v. Norway, Judgment, 5 September 1933, Permanent Court of International Justice (PCIJ)," http://www.worldcourts.com/pcij/decisions/1933.04.05_greenland.htm (accessed 13 October 2011).

[27] *Time Magazine*, "Norway-Denmark: Brother Christian Wins."

[28] Keller, *The Eastern Settlement Reconsidered*, 5, 17, 109.

Fieldwork by the 1976-77 Inuit-Nordbo Project changed this pattern of limited collaboration, and used a multi-disciplinary team with access to carbon dating. By examined the middens of three farms, they showed continued life in certain valleys after the larger community disappeared.[29] Thomas Howatt McGovern did an analysis of this project as his dissertation from the University of Michigan, using examination of seeds and larvae, fauna and flora, climatic conditions, and other physical factors.[30]

Greenland was on the edge of the European world, and has remained there as an object of historical study. Three key writers helped stimulate interest in Greenland. Fridtjof Nansen brought world attention to Greenland by making the first crossing of the Greenland icecap in 1888, ending at Austmannadalen in the Western Settlement.[31] He influenced historians by claiming the Norse were incapable of surviving on their own due to their diet without wheat, and merged with the Thule in a native lifestyle.[32]

In the 1960s, Helge Ingstad and his wife Anne Stine, an archaeologist, discovered an ancient Viking settlement in Newfoundland, which they name l'Anse aux Meadows. This proved the hypothesis that Leif Eriksson travelled from Greenland to America due to the similarity of the buildings found in Greenland and Newfoundland.[33]

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[29] Claus Andreasen, "Nipaitsoq og Vesterbygden [farm Nipaitsoq and the Western Settlement]," *Grønland [Greenland]*, 5-6-7, 1982, Charlottenlund, Denmark: Det Grønlandske Selskap. Tema: Nordboerne (Theme, the Norse) 1: 188. Study sponsored by the Nationalmuseet (National Museum) and Kalaallit Nunaata Katersugaasivia (Grønlands Landsmuseum, Greenland National Museum).

[30] McGovern.

[31] Daniel Bruun, "Arkœologisks Undersøgelser, Godthaabs og Frederikshaabs Distrikter i Grønland" ("Archeological explorations in Godthaab and Frederikshaab districts in Greenland"), *Geografisk Tidskrift [Geographic Journal]* VII, 1903-04: 10. Nansen gave the valley its name.

[32] Fridtjof Nansen, *In Northern Mists: Arctic Exploration in Early Times*, vol. 2, translated by Arthur G. Chater (New York: AMS Press, 1969, reprint from 1911), 96, 100.

[33] Wahlgren, 124-129. Overall this stimulated further research about the Norse colonies.

Jared Diamond brought Greenland into recent popular literature with his book Collapse: *How Societies Choose to Fail or Succeed* in 2005. He blamed the Norse for being too European and not adapting to Arctic conditions, a theory fairly accurate for the Eastern Settlement. However, he lacked historical accuracy when he doubted that the Norse hunted walruses themselves, and said they had a prohibition against eating fish.[34] He brought the demise of the Norse settlements to world attention, concurrent with the melting Greenland icecap as scientists discussed global warming.[35]

Research on the Western Settlement in Greenland has moved beyond single factor theories and nationalistic teams focused on parts of the available evidence. Danish and Icelandic historians once blamed the Norwegian monarchy for forcing union on the Greenland settlements in 1261, while Norwegians blamed Danish monarchs for losing contact with Greenland. These theories have faded with modern archeological and climatic data, as has the fight between Norway and Denmark, who competed more fiercely for Greenland than the Norse and Thule ever did. Multi-disciplinary researchers now provide a sophisticated synthesis of archeological excavation, climate and ice core analysis, and examination of plant and animal remains. The University of Greenland at Nuuk has the most collection of studies, although records remain scattered in Denmark, Norway, and Iceland. Another resource is an excellent bibliography by Kenneth Miller of studies about Greenland.[36]

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[34] Diamond, 229, 261.

[35] *National Geographic*, "Global Warming: Greenland When It's Hot," http://www.national geographic.com/adventure/adventure-travel/greenland/global-warming.html (accessed 22 October, 2011.

[36] Kenneth E. Miller, *Greenland* (Oxford: CLIO Press, 1991).

Missing from the historiography to date was a thorough assessment of the relationship between the Eastern and Western settlements. This relationship was central to the departure of the Western settlers, who found themselves increasingly at odds with the changing political and economic structure of the Eastern Settlement. While the hunters lost their livelihood and felt the cooling climate far sooner than their southern relatives, they were neither blind nor dumb; they could see the numerous church building at Gardar, and the growing wealth of the Eastern Settlement. There was also greater stratification of classes, and excessive usage of imports by the upper class in the Eastern Settlement. Thomas McGovern covered many of the changes in his dissertation without specifically tying in the discontent of the Western Settlement. Christian Keller documented a possible uprising in Greenland in the 1270s between the church and laypeople, again not tying it specifically to the Western Settlement.[37]

Studying the history of the two settlements showed deep political and economic differences leading to the departure of the settlers of Western Settlement, who displayed their discontent by not sending word on where they were going to the Eastern Settlement. They apparently tore down one church in protest at departure (the Thule never touched churches in the Eastern Settlement). In 1923, Hans wrote of the badly collapsed church ruin at Ujaragssuit near Godthaab: "I have since asked the savages if they had destroyed this stone building, but they answered that the Norwegians themselves did it when they left the country; that is all they know about this."[38]

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[37] Keller, *Eastern Settlement Reconsidered*, 144.

[38] Poul Nørlund, *Viking Settlers in Greenland and their descendants during Five Hundred Years* (New York: Krause Reprint Co., 1971, Reprint, original Copenhagen: G. E. Gads Forlag, 1936), 139.

Chapter 3

ESTABLISHMENT OF THE WESTERN SETTLEMENT

The story of the Greenland settlements actually started much earlier on the western coast of Norway with its poor farmland and increasing violence in the 800s. Pagan Vikings at this time, they were hot-tempered and quick to take offense, leading to blood feuds among families for the slightest provocation.[39] In an atmosphere of "survival of the fittest," they wanted their own privately owned living space away from arbitrary rule, especially when Harald Fairhair imposed himself on local autonomy in becoming the first king of Norway. Norse sailors discovered Iceland in around 874, leading to an exodus of Norwegians on the wrong side of Harald's reign. They formed the first democratic parliament in the world called the *althing*, and never voted for a king.[40]

As the best land in Iceland filled up, refugees continued to flee Norway until about 930.[41] The first settlers got parcels on the south and west coasts, with the warming influence of the Gulf Stream, whereas late-comers had to settle for land on the north and east coasts, hit by the polar currents. Iceland was a land of contrasting beauty and desolation, with much unusable land due to glaciers, volcanoes and geysers, but it gave them freedom: "To them, the mere interference in their personal independence was a far more heinous thing than any tax they would have had to pay. The latter was a negligible factor in their impetus to get away."[42] They voted for their leaders and taxes.

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[39] Enterline, 3-4.
[40] Enterline, 4. Head of the *althing* was the lawspeaker, an elected position based on merit.
[41] James Graham-Campbell, *The Viking World* (New York: Tricknor and Fields, 1980), 82.
[42] Oxenstierna, 247.

Along with the settlers went people banished for murder for a set period of time, as Norway had no death penalty. In about 960, Thorvald Asvaldsson got in difficulty killing one of King Håkon the Good's men.[43] Arriving in Iceland after the first settlers, he ended up on the cold and rocky northwest coast. His son Erik Thorvaldsson had a fiery temper to match his red hair, earning the nickname Erik the Red. Not surprisingly, Erik got into a blood feud ending in murder in 982, receiving a three year banishment.[44]

Erik remembered stories about a man named Gunnbjörn Ulfsson being blown off course in about 900 and discovering very small islands that he named for himself, "Gunnbjörn's Skerries," between Iceland and a large unnamed place.[45] No one raced to explore the ice-covered mainland, until Erik visited it in 982. While what Erik named Greenland was two hundred miles from Iceland, both had mountains so high that sailors could see Snœfellsness in Iceland and Angmagsallik in Greenland when halfway across the Denmark Strait.[46] During his three years of banishment, Erik lived off the land hunting and fishing, and visited every fjord on the southwest side of this new land; he returned to the coast before winter to avoid being locked in the fjords by pack ice.[47]

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[43] *Norsknettskole [Norwegian Internet School]*, "Håkon den gode [Håkon the Good]. http://www. norsknettskole.no/fag/ressurser/itstud/fuv/steinma/hakon.html (accessed 21 November 2011). Håkon was the youngest son of Harald Fairhair, and won the position by a vote of the people. His oldest brother Erik Bloodaxe ruled only two years before being kicked out for violence, and ending up in England as a blood-thirsty ruler in York. Håkon won the position by merit, not by birth order, and ruled wisely, earning the nickname "the good." Håkon brought Christianity to Norway; however the people rejected this and continued worshipping Odin and Tor.

[44] Graham-Campbell, 78. The Norse used a patronymic form as last name, with sons taking father's first name with son or sen added, daughters adding datter to father's first name, i.e. Thorvald Asvaldsson, Erik Thorvaldsson, Leif Eriksson, Freydis Eriksdatter (Erik's daughter).

[45] Oxenstierna, 249.

[46] Holger Arbman, *The Vikings: Ancient Peoples and Places*, translated and edited byAlan Binns (London: Thames and Hudson, 1961, 1965), 110.

[47] Oxenstierna, 249.

Erik Thorvaldsson used his time of banishment well, and returned to Iceland with a solid plan for new settlements. Since both he and his father received banishment for murder, it made sense to find new lands less crowded, where he had a chance of starting over and staying out of trouble.[48] He had no trouble finding recruits among latecomers to Iceland who had poor land, as he told stories of beautiful pastures and excellent hunting. Erik was a shrewd man, and picked the name Greenland to gain more settlers. The name had merit, as Greenland was far greener than Iceland in summer; also the ends of the fjords had rich grass, and warmer summers than Iceland.[49]

In 986, Erik the Red led twenty-five ships from Iceland to Greenland, with the heavily laden ships carrying 500-700 men, women, children, their domestic animals, cooking tools, and farm equipment. Fourteen of the ships made the trip to Greenland, with the other eleven either sinking in storms or returning to Iceland.[50] The survivors founded two prosperous settlements on the southwestern coast of Greenland, which was warmer and had less ice than the eastern coast due to the Greenland Current from the Arctic (see map next page).[51] Erik took the best farm for himself as the leader of the colony at Bratthild in the larger, more prosperous Eastern Settlement. He also claimed the Sandnes farm in the Western Settlement for the eventual leader of that settlement.[52]

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[48] Enterline, 8-9.

[49] W. A. Graah, *Narrative of an Expedition to the East Coast of Greenland Sent by Order of the King of Denmark, in Search of the Lost Colonies,* translated from Danish by G. Gordon MacDougall (New York: AMS Press, 1978, reprint of original, London: John W. Parker, 1837), 1.

[50] Oxenstierna, 250.

[51] *The King's Mirror [Speculum Regale - Konungs Skuggsjá]*, written ca. 1250 in Norway, translated from Old Norwegian by Laurence Marcellus Larson (New York: The American-Scandinavian Fountation, 1917), 138.

[52] Seaver, The Last Vikings, 21. While presumably a member of his family, this was unclear.

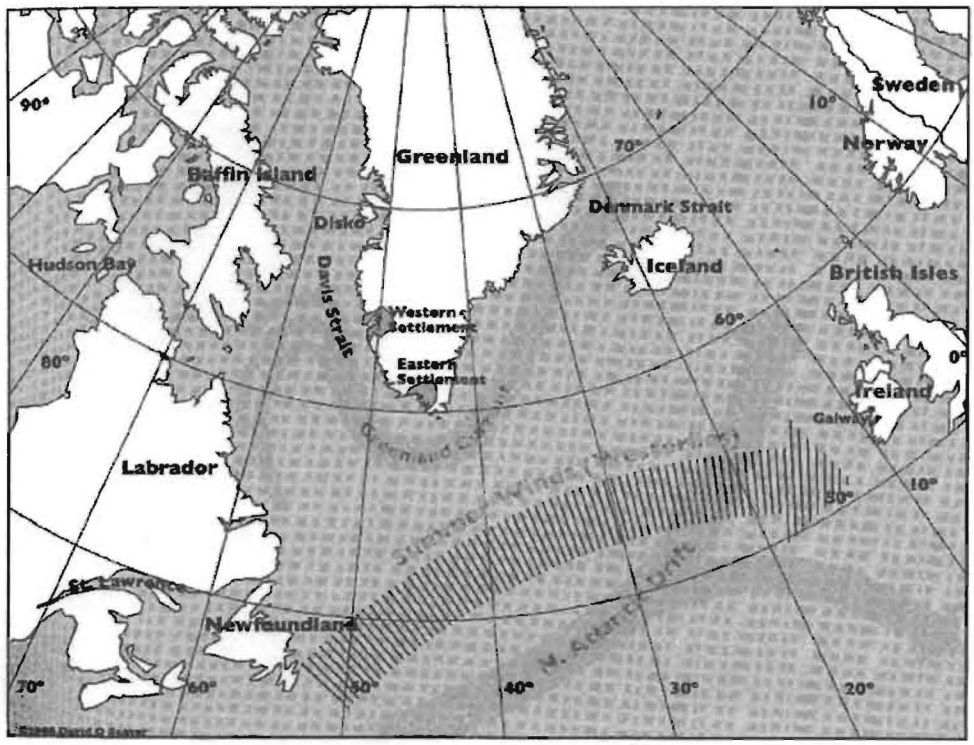

Figure 1: Map of the North Atlantic[53]

Naming the two colonies as the Eastern and Western Settlements seemed a bit strange to later generation; to Erik the Red, the latter colony was west in terms of longitude.[54] Important to the Norse were the main hunting ground Nordrsetar near Disko Bay, and the Vestri Obygd on Baffin Island at Cumberland Sound. [55]

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[53] Seaver, *The Last Vikings*, map by David O. Seaver, xxi. The Greenland Current flowed from the Arctic, bringing sea ice down the eastern coast of Greenland and around to the west coast, frequently blocking entrance to the Eastern Settlement. The current turned toward Baffin Island at the latitude of the Western Settlement, moving the sea ice away from the coast, and making it an easy sail across the Davis Strait. It was easier to take the current south to Labrador and catch the Summer Westerlies back to Greenland or Iceland, than to fight the Greenland Current going south on the west coast of Greenland. Baffin Island and Labrador were more accessible to the Western Settlement than Iceland or Norway.

[54] Finnar Jónsson, *Det gamle Grønland Beskrivelse af Ivar Bårdssön [The Old Greenland's Descriptions by Ivar Bårdssön]* (København: Levin & Munksgaards Forlag, 1930), 29.

[55] Mowat, 332-33. Translations: *Northern Seter, Western Wilderness.* Eastern and Western settlements also known as Ostrebygd and Vestrebygd in Old Norse, as one of several spellings.

The Eastern Settlement had more pasturage and easier winters than the Western Settlement; in addition it was closer to Iceland and Norway for trading. While it looked like the better location, it also had more drift ice from the east coast. Ships had trouble getting through this drift ice even in summer. Its many fjords opened directly to the coast, which left it at risk for pirate raids in the 1400s.[56]

The biggest drawback of the Eastern Settlement was that it attracted important men from Iceland, who began to compete as to whether Bratthild or Gardar was the main farm, along with Hvalsey and Herjolfsness.[57] Erik lived at Bratthild which was the center of the settlement during his life; however, what the Greenlanders called a cathedral appeared later at Gardar, with numerous church buildings (despite the fact that they rarely had a bishop, and never an archbishop). The settlement also attracted the status-seeking behavior of Icelandic and Norwegian society, including up-to-date European fashions. Clothing at Herjolfsness came from the styles of the 1400s in Europe, somehow reaching Greenland.[58]

Four hundred kilometers to the north (250 miles), the Western Settlement was far from civilization: "Then there is six days' rowing in a six-oared boat with six men to Vestri Bygd." This was from the Mid Bygd half way between the settlements.[59] Not every one handled being so far from civilization, and some returned to the Eastern Settlement. As mentioned, the Greenland Current made the trip south difficult.

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[56] Seaver, *The Frozen Echo*, 175.

[57] Seaver, *The Last Vikings*, 21.

[58] Lindegaard, 33. The Eastern Settlement kept going until the end of the 1400s.

[59] ólafur Haldórsson, "An ancient description of Greenland," English translation by Joan Turville-Petre, *Medieval Scandinavia*,12, 1988: 245. Bygd was Norse for a settlement. The middle settlement apparently died out early, and has little mention in accounts of the settlements.

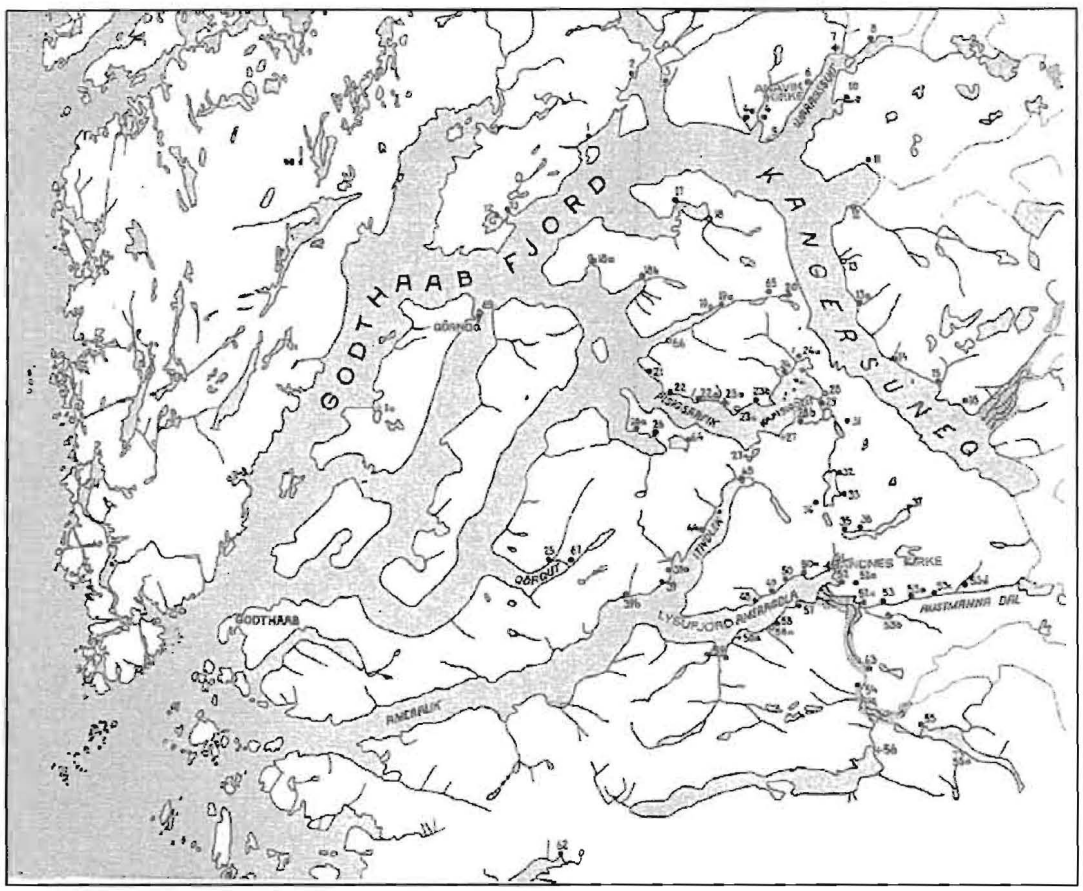

Figure 2: Map of Western Settlement [60]

The Western Settlement was on a complex fjord system, which emptied at Godthaab, now Nuuk. Sandnes, V-51, was the main farm, marked Sandnes Kirke [Church] in the lower right on Lysufjord. The other two farms with churches were V-7 in top right, and V-23a in middle right, both with very small crosses. Sailing took 9-18 hours to V-51, 10-20 hours to V-23a, and 14-28 hours to V-7, depending on the wind.[61]

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[60] Knud J. Krogh, *Erik den Rødes Grønland [Erik the Red's Greenland]* (Odense, Denmark: Nationalmuseet, 1967), 183. Scale 1 inch=13.46 miles, Sandnes 43.75 miles (70 km) from fjord exit.

[61] McGovern, 159. Sailing time was from the mouth of the fjord system. Danish archeologists numbered the farms starting in the north with Ø (Øst) for Eastern and V (Vest) for Western.

Sailing within the fjord system to the separate parts of the Western Settlements was difficult due to winds. The ninety farms of the Western Settlement were placed back in ten fjords off four major fjord systems with three main farms due to the distance. Well-hidden from the coast, the settlement had tricky tides and fierce winds, giving it natural protection from pirates. Its biggest advantage was being closer to the hunting grounds at Disko Bay. Also, it was further away from "civilization," including the Eastern Settlement, giving the settlers a greater sense of freedom.

Despite being far away, the opening of the fjord system near Godthaab (Nuuk) had importance for the Western Settlement. Here the settlers gathered wood for their fires and buildings, as salt-soaked driftwood came to the coast of Greenland from as far away as Siberia, and from shipwrecks.[62] Whales beached themselves at the coast, giving good flesh for food, blubber for lighting homes, and bone for tools. Most importantly, the harp seal spent its summers at the coast.[63] As a disadvantage, the bottleneck where the fjords emptied into the ocean made the settlement a natural trap.

The Greenland settlers adapted to the challenges of the North, which they experienced in both Norway and Iceland. While the topography of the Western Settlement was severe without trees, the settlers adapted easily to this terrain, so like Iceland and northern Norway but with better summer weather. They were used to marginal farms supplemented by a hunting lifestyle, and adapted to what they found.

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[62] Roussell, 22. Driftwood of tree trunks ten meters long could pierce a ship on contact. This driftwood could be used for firewood and framing buildings , but not for ships that needed fresh wood.

[63] McGovern, 111-12. Harp seals pupped off South Labrador in March, and moved to Greenland when the pups were able to swim, spending late May and June at the Western Settlement eating capelin.

However, living in an isolated fjord system was difficult because of the sudden, severe storms. Greenland had a unique climate due to its geography. While the southwestern coastal regions of Greenland had the fjord systems with green grasses, the vast interior of Greenland was a massive spine of granite between two and three kilometers in height, topped by a vast sheet of ice of equal thickness. This interior ice led to extreme changes of weather in Greenland, affecting travel up the fjords:[64]

> I shall tell you something about the nature of the land. When storms do come, they are more severe than in most other places, both with respect to keen winds and vast masses of ice and snow. But usually these spells of rough weather last only a short while and come at long intervals only. In the meantime the weather is fair, though the cold is intense. For it is the nature of the glacier to emit a cold and continuous breath which drives the storm clouds away from its face so that the sky above is usually clear.[65]

Being so far inland and close to the glaciers did have advantages, as the ends of the fjords in the Western Settlement enjoyed a continental summer with more sun, less wind, and warm, drier weather than the Eastern Settlement closer to the coast. Sandnes was in a glaciated bowl, as were most of the larger farms, with ample grazing around the site and up the mountain. Goats grazed the steepest hills, giving milk and cheese products, while sheep stayed outside all winter with their thick coats, providing the wool for Greenland's famous woven vadmål, a very soft and warm cloth. Seters, or small summer farms in the mountains, gave excellent pasturage in the mountains for sheep and goats grazing on their own, with the medium sized dogs of the settlers for herding and protection. The Norse also cut hay at mountains patches.[66]

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[64] Seaver, *The Last Vikings*, 31.
[65] *The King's Mirror*, 153.
[66] McGovern, 133-37.

Although Arctic, it had richness in its nature. Numerous lakes and streams from the icecap gave good sources of drinking water. Clay soil trapped water at the top in marshy areas, keeping the pastures wet and producing mushrooms and berries.[67] The *Kongspillet [King's Play]* in the early 1200s proclaimed: "But most of them do not know what bread is, and have never seen bread!"[68] However, the settlers raised linseed, knot grass, chickweed, and angelica, and also used lyme grass, iceland moss, and reddish seaweed dulse with a salty sweet taste.[69] On a good day, Greenland fit its name:

> You ask what the inhabitants live on in that country since they sow no grain; but men can live on other food than bread. It is reported that the pasturage is good and that there are large and fine farms in Greenland. The farmers raise cattle and sheep in large numbers and make butter and cheese in great quantities. The people subsist chiefly on these foods and on beef; but they also eat the flesh of various kinds of game, such as reindeer, whales, seals, and bears.[70]

A great strength of the settlement was that it provided ample high quality protein for the settlers' overall health. Their small cows gave the highest quality protein on the least grazing area. Now extinct, they were similar to the small medieval cows of Denmark, light-boned, highly resistant to cold and damp, and tougher than modern cows.[71] A main staple of the settlers was creamy skyr coming from milk and processed

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[67] McGovern, 129. Norwegians have a long tradition of picking mushrooms and berries.

[68] Jørgen Meldgaard, "Landmandsliv i Grønlands Nordbotid [Peasant life in Greenland's Norse Period]," *Handle [Trade]*, 19 January 1950: 98. Norwegian text: "Men de fleste I det ved dog ikke, hvad Brød er, og har aldrig set Brød!"

[69] Seaver, *The Last Vikings*, 32.

[70] *The King's Mirror*, 145.

[71] McGovern, 123-31.

with rennet, which lasted all winter. Whey (a thick, acidic bluish liquid made from soured milk) was both a drink and food preservative, valuable for its rich milk sugars.[72]

Pigs did not thrive that far north in Greenland, so the Norse used three types of seals in lieu of pigs, with up to 70% seal bones in the midden (trash heaps) of smaller farms. The high status Sandnes farm had less than twenty-five percent seal bones in its midden, preferring to eat beef and caribou. The harbor seal (common seal) hauled out on flat rocks or sandy beaches to breed and pup in late May to July near Sandnes Farm, providing high quantities of seal meat to the entire settlement. The settlers hunted the harp seal at the coast, while the hooded seal was rare at the Western Settlement.[73]

Additionally, fish abounded in both the fjords and mountain lakes; *Lysufjord* got its name from *lysa*, a type of cod, while *Agnafjord* came from *agn*, or fishing.[74] Perfect suited for a windy, cold, and bright climate, Atlantic cod ended up on racks drying into stockfish in Greenland, and provided food on voyages and hunts "spread with butter or blubber for more calories."[75] Nine years before Diamond's comment about the Norse having a prohibition against eating fish, Kristin Seaver, a naturalized American writer of Norwegian birth, solved the issue of the Norse supposedly not eating fish in her 1996 book *The Frozen Echo: Greenland and the Exploration of North America ca A.D. 1000-1500.* Medieval Norwegian sites also lacked fish bones and fish heads, for these were too valuable to throw away; rather they were ground into valuable protein powder to

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[72] Seaver, *The Last Viking*, 35. *Skyr* is a type of strained yogurt, classified as a very soft cheese.

[73] McGovern, 107-08. The common seal avoided sea ice, and liked both the climate and water temperature of the Western Settlement. The hooded sea predominated near the Eastern Settlement.

[74] *Grønlands Historiske Mindesmærker*, 879-80.

[75] Seaver, *The Last Viking*, 33. Iceland and Northern Norway used the same drying technique.

feed cattle and horses. From her own childhood, Seaver remembered Norwegians grinding fish bones into protein powder for human use during World War II.[76]

Two other sources of protein came from caribou and whales. Ameralik and Kangersuneq Fjords still have the best caribou hunting in Greenland, in the mountains behind the Western Settlement. The Norse killed animals that walked by the farms even in the dead of winter, as the caribou scratched through the snow to find reindeer moss, and used valley bottoms for shelter from winter storms.[77] The Norse had two types of dogs, one of medium size presumably for herding, and a larger type like a long-limbed deerhound. These large dogs drove the caribou down to the fjord to kill, or through lines of waiting hunters, and even brought down wounded animals on their own.[78] Whales beached at the coast, and, as noted, provided flesh, blubber, and tools.[79]

From the start, the Western Settlement had minimal subsistence farming due to the northern latitude, and focused on hunting and fishing. Before the climate cooled, the Western Settlement did well, with functional farms and ample hunting. Overall, the Western Settlement had many advantages to living in the Eastern Settlement, at least for those tough enough to handle the isolation, sudden storms, and long winters. It was a peaceful beautiful setting, both isolated and connected to others at the same time as they hunted communally. They had plenty of room between farms, which had been carefully placed, with a one-kilometer radius for farms with good pasture and five-kilometer

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[76] Seaver, *The Frozen Echo*, 56-57.

[77] McGovern, 122-23. The Norse farms were in the same sheltered valleys used by the caribou.

[78] McGovern, 119-20, 139-40.

[79] *The King's Mirror*, 120-124. These whales included the humpback, right whale, and rorqual (probably blue whale).

radius for poorer mountainous farms.[80] It presumably took a special kind of personality to survive there, something Erik the Red recognized in the beginning.

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[80] McGovern, 152.